

What we claim is:

1. A nanofiber coated or doped with at least one optical material.
2. The nanofiber of claim 1 wherein the nanofiber is selected from the group consisting of a polymer nanofiber, a carbon fiber nanofiber, a ceramic nanofiber and mixtures thereof.
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3. The nanofiber of claim 1 wherein the optical material is selected from the group consisting of metal, metal oxide, rare earth metal, group IV material, and mixtures thereof.
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4. The nanofiber of claim 1 wherein the optical material is selected from the group consisting of cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, their oxides, carbides, borides, and nitrides, and mixtures thereof.
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5. The nanofiber of claim 1 wherein the nanofiber is selected from the group consisting of polydiphenoxypyrophosphazene, SiO_x, titania, and mixtures thereof and the coating is selected from the group consisting of erbium, homia, ytterbia, and mixtures thereof.
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6. The nanofiber of claim 1 wherein the nanofiber is additionally coated or impregnated with catalyst particles whereby the catalyst will produce heat through exothermic reactions with reagents exposed to the nanofibers.
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7. The nanofiber of claim 1 wherein the nanofiber is additionally doped with rare earth metal or metals that can produce colors in the near-IR portion of the spectrum.
8. The nanofiber of claim 1 wherein the optical material is present in an effective amount to produce a response to thermal energy and to result in the emittance of detectable radiation.
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9. The nanofiber of claim 1 wherein the optical material is present in an amount of 5% to 50% by weight based upon the weight of the nanofiber.
10. The nanofiber of claim 1 wherein the optical material is present in an amount of 10%
5 to 45% by weight based upon the weight of the nanofiber.
11. The nanofiber of claim 1 wherein the optical material is present in an amount of 15% to 45% by weight based upon the weight of the nanofiber.
- 10 12. The nanofiber of claim 1 wherein the optical material is present in an amount of 10% to 35% by weight based upon the weight of the nanofiber.
13. The nanofiber of claim 1 wherein the optical material is present in an amount of 15% to 30% by weight based upon the weight of the nanofiber.
- 15 14. The nanofiber of claim 1 wherein the optical material is present in an amount of 5% to 50% by weight based upon the weight of the nanofiber.
15. The nanofiber of claim 1 wherein the nanofiber is additionally doped with rare earth
20 metal or metals selected from the group consisting of erbia, homia, ytterbia, and mixtures thereof that can produce colors in the near-IR portion of the spectrum.
16. The use of the nanofiber of claim 6 as chemical or biological agent sensors.
- 25 17. The use of the nanofibers of claim 1 in energy conversion systems.
18. The use of the nanofiber of claim 1 in a thermophotovoltaic device.
19. Fabric that has incorporated the nanofiber of claim 1.
- 30 20. The use of the nanofiber of claim 1 to produce detectable near-IR radiation.